

A TAXONOMIC STUDY OF THE GENUS *AILOLOPUS* FIEBER (ORTHOPTERA, OEDIPODIDAE) FROM CHINA, WITH DESCRIPTION OF A NEW SPECIES

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Abstract The genus *Aiolopus* Fieber from China is reviewed, with five species recorded. One new species, *Aiolopus morulinarginis* sp. nov. is described. Key to species of *Aiolopus* is provided. Type specimens are kept in the Institute of Zoology, Shaanxi Normal University.

Key words Orthoptera, Oedipodidae, new species, China.

Aiolopus was erected by Fieber in 1853. The genus includes 13 species, from Africa, Europe, Asia and Oceania. In China, the genus distributes from Liaoning Province and Xinjiang Automation Region to Haman Province, including 5 species, and one is new to science. Type specimens are preserved in Insect Collection of Institute of Zoology, Shaanxi Normal University.

Genus *Aiolopus* Fieber, 1853

Aiolopus Fieber, 1853. 3: 100; B.-Bienko & Mischenko, 1951. 567; Xia, 1985. 143; Hollis, 1968. 22 (7): 314; Yin, 1984. 100; Zheng, 1985. 196; Zheng, 1993. 210; Zheng and Xia, 1998. 90-91.

Epacrania Fieber, 1867. 1 (12): 135, 166.

Aedophilus B.-Bienko, 1966. 45: 1793.

Type species: *Aiolopus thalassinus* (Fabricius, 1781)
(= *Gryllus thalassinus* Fabricius, 1781)

Body moderate, symmetry. Vertex triangular, faveola trapezoidal, frons slightly oblique. Frontal ridge flat, lateral keels of frontal ridge upper apical constricting and wider downwards, only slightly incurved at median ocellus. Antennae filiform. Eyes long oval. Middle of pronotum constricting like saddle, median keel distinct, lateral keels absent or prozona present feebly; anterior margin straight, posterior margin with obtuse angular protuberance. Width of interspace of mesosternum lobes longer than its length. Both tegmen and wing developed, beyond the apex of hind femur, intercalary vein distinct in media area, with stridulatory pegs, subcostal area with green longitudinal stripe usually, upper median keel of hind femur smooth. Outer apical spine of hind tibia absent. Anal plate of male triangular shaped, subgenital plate short conical. Base of valvulae thick, apical sharp.

Key to the species of *Aiolopus* Fieber

- Hind tibia considerably shorter than hind femur, with a maximum of nine outer and ten inner spines; frontal ridge coarsely and densely pitted, without lateral carinulae, with margins converging strongly just below fastigium; prozona of pronotum gradually sloping away on each side of median carina and without trace of lateral shoulders; hind femur broad or very broad. Dist. Egypt, Algeria, Nigeria, Niger Colony, Sudan, Kenya, Somaliland, Uganda, Angola, N. Rhodesia, S. W. Asia,

- India, Mudura *Aiolopus simulatrix* (Walker, 1870)
Hind tibia as long as or slightly shorter than hind femur, with at least nine to twelve outer and ten to thirteen inner spines; frontal ridge more sparsely pitted, if coarsely pitted then not narrowing strongly just below fastigium; pronotum almost flat or slightly saddle shaped, prozona either with pattern suggesting presence of lateral carinae or almost flat dorsally and without median constriction; hind femur narrow or broad 2
- Hind tibia and inner part of hind femur black. Dist. China
..... *Aiolopus nigrithibis* Zheng & Wei, 2000
Hind tibia and inner part of hind femur not black 3
- Pronotum almost flat dorsally and without constriction in prozona; hind tibia with ten outer and eleven inner spines, red except for basal quarter; antennae shorter than combined lengths of head and pronotum. Dist. S. Europe, Africa, Asia Minor, S. W. Asia
..... *Aiolopus strepens* (Latreille, 1804)
Pronotum slightly saddle shaped and with median prozonal constriction; hind tibia with nine outer and ten inner spines; antennae at least as long as combined lengths of head and pronotum 4
- Arolum of hind tarsus very small, about one quarter the length of claw; frontal ridge weakly sulcate and with parallel, obtuse lateral carinulae which extend almost to base of frons. Dist. C. Asia
..... *Aiolopus oxianus* Uvarov, 1926
Arolum of hind tarsus larger, about half length of claw; frontal ridge normally flat, if sulcate than lateral carinulae gradually converging upwards 5
- Fastigial foveolae weak, ovoid with poorly developed margins; prozona of pronotum with lateral carinae moderately; hind tibia with twelve outer and twelve or thirteen inner spines. Dist. Komodo, Sumba Island, Indonesia
..... *Aiolopus carinatus* (B.-Bienko, 1966)
Fastigial foveolae rectangular or trapezoid, with well developed margins; prozona of pronotum with lateral carinae absent or very weakly developed; hind tibia with nine or ten outer and ten or eleven inner spines 6
- Antennae very long, when extended backwards almost reaching base of hind femur; face broad; large species with very prominent criss cross pattern on dorsum of pronotum; hind femur of medium thickness. Dist. Nigeria, Tanganyika, Zanzibar, Kenya
..... *Aiolopus longicornis* Sjöstedt, 1909
Antennae not longer than combined lengths of head and pronotum; face narrow 7
- Fastigial foveolae broadly trapezoid hardly one and a half times longer than wide; hind tibia not black ventrally; pronotum short and broad. Dist. East and southern Africa *Aiolopus meruensis* Sjöstedt, 1909
Fastigial foveolae narrowly trapezoid, about twice bluish in apical two thirds or almost completely black ventrally, pronotum narrow 8
- Ventral surface of hind tibia completely black or dark brown in apical three quarters fastigial foveolae rectangular and about one and a half times longer than wide. Dist. New Caledonia, Loyalty Isl., N. Hebrides ...
..... *Aiolopus dubius* Willemsse, 1923

- Ventral surface of hind tibia with dark colouration if present, broadly interrupted with reddish, bluish or ochraceous band; fastigial foveole narrowly trapezoid about twice as long as wide 9
9. Hind femur of medium thickness, ratio of length to width between 3.4 and 4.0; tegmen shorter, ratio of length of tegmen over length of pronotum between 4.1 and 4.9; hind tibia without red colouration. Dist. Rodriguez, Rodriguez Islands, Aldabra, Atoll, Farquhar Atoll, Chagos, Seychelles *Aiolopus rodericensis* (Butler, 1876)
Hind femur narrower, ratio of length to width 4.0 or more; tegmen longer, ratio of length of tegmen over length of pronotum 4.7-5.5 10
10. Subcostal area of tegmen of both sexes with a green longitudinal stripe, without white spot 11
Subcostal area of tegmen of both sexes without green stripe, basal part with white spot or stripe 12
11. Vertex narrow, apex narrowly acutangular, keels of lateral margins straight, not incurved, reaching anterior edge of eyes. Frontal ridge constricting upward from middle ocellus. Foveola narrow and long. Green stripe in subcostal area of tegmen complete, without dark points. Basal 1/3 of hind tibia yellow, middle part blue, apical part often freshly red. Dist. East India, Sri Lanka, Burma, Iran, Japan, Australia, Java, Celebes, China *Aiolopus tamulus* (Fabricius, 1798)
Vertex wide, apex nearly rounded, keels of lateral margins incurved at end, not reaching anterior edge of eyes. Frontal ridge wide and flat, with nearly parallel lateral margins. Foveola wide and short. Green stripe in subcostal area of tegmen often with dark points. Basal half of hind tibia yellow, apical half red, with a narrow, darkish blue ring at middle. Dist. Congo, Zambesi, N. Africa, Europe, W. Asia, China, Christmas Island ... *Aiolopus thalassinus* (Fabricius, 1781)
12. Keels of lateral margins of vertex straight, not incurved, reaching anterior edge of eyes. Subcostal area of tegmen near the basal 1/3 with a obvious white spot. Basal part of hind wing yellowish green, the other part dark brown. Basal 2/3 of hind tibia yellow white, apical 1/3 red, middle part with a dark spot. Apex of female ovipositor valves straight, not hooklike. Dist. China *Aiolopus markensis* Yin, 1984
Keels of lateral margins of vertex incurved at end, reaching anterior edge of eyes. Subcostal area of tegmen with a white stripe in basal half. Hind wing transparent, outer margin dark brown. Hind tibia black, with two wide yellow rings in the middle. Dist. China
..... *Aiolopus morulimarginis* sp. nov.

1 *Aiolopus nigrithibis* Zheng et Wei, 2000

Aiolopus nigrithibis Zheng et Wei, 2000. 22 (2): 197-198.

Specimens examined. 3♂♀, Guangxi, Yizhou, 20 Sep. 1999.

Distribution. Guangxi.

2 *Aiolopus tamulus* (Fabricius, 1798)

Gryllus tamulus Fabricius, 1798. 195.

Gomphocerus tridoripes Brumeister, 1838. 2: 649.

Epacromia nifostriata Kirby, 1888. 550.

Epacromia tamulus (Fabr.); Shiraki, 1910. 21.

Aiolopus tamulus (Fabr.); Kirby, 1914. 122; B.-Bienko & Mistshenko, 1951. 568; Xia, 1958. 143; Zheng, 1993. 210; Zheng and Xia, 1998. 93-94.

Aiolopus thalassinus tamulus (Fabr.); Hollis, 1968. 22 (7): 319, 347; Zheng, 1985. 196.

Specimens examined. 15♂♂, 20♀♀, Shaanxi, Xi'an, 20 Sep. 1958; 5♂♂, 3♀♀, Shaanxi, Chang'an, 29 Oct. 1959; 2♂♂, 4♀♀, Shaanxi, Hanzhong, 15 Aug. 1960; 3♂♂, 1♀, Shaanxi, Yan'an, 7 Sep. 1962; 2♂♂, 2♀♀, Yunnan, Kunming, 9 Sep. 1974; 1♂, 4♀♀, Yunnan, Shilin, 12 Sep. 1974; 2♂♂, 3♀♀, Yunnan, Yuanmou, 2 Oct. 1982; 5♂♂, 2♀♀, Guizhou, Luodian, 15

Oct. 1974.

Distribution. Shaanxi, Sichuan, Yunnan, Guizhou, Gansu, Ningxia, Tibet, Hebei, Liaoning, Taiwan, Hainan, Xisha Islands.; India, Burma, Sri Lanka, Southeast Asia and Oceania.

3 *Aiolopus thalassinus* (Fabricius, 1781)

Gryllus thalassinus Fabricius, 1781. Spec. Ins., 1: 367.

Aridium griseum Costa, 1836. Fauna del regno di Napoli, Ortoteri. 25.

Aridium laetum Brulle, 1840. Orthoptera. Histoire naturelle des Iles Canaries (2): 77.

Epacromia angustifemur Ghilian, 1868. Bull. Soc. Ent. Ital., 1: 179.

Epacromia hirta Brancsik, 1895. Jh. natuwl. ver. Trencsner Kom.: 250.

Aiolopus thalassinus kivuensis Sjöstedt, 1923. Ark. Zool., 15 (6): 18.

Aiolopus thalassinus (Fabr.); B.-Bienko, 1951. Acridoidea of the USSR and adjacent Countries: 568. Hollis, 1968. Bull. Brit. Mus. (Nat.) Ent., 22 (7): 319. Zheng, 1993. Artoxonomy, 210. Zheng and Xia, 1998. Fauna Sinica. Insecta, V. 10. Orthoptera, Acridoidea, Oedipodidae and Arcypteraidae, 94-96.

Aiolopus aatus Uvarov, 1953. Publ. cult. Co. Diam. Angda. 21: 111.

Specimens examined. 3♂♂, 4♀♀, Xinjiang, Buerjin, 6 Aug. 2005; 1♂, 1♀, Xinjiang, Fuhai 12 Aug. 2005; 2♂♂, Xinjiang, Thermalspring, 24 July 2005.

Distribution. Xinjiang, Gansu, Sichuan, Yunnan Province; The species also distribute in France, Switzerland, Russia, Turkey, India, Sudan, Kenya, South Africa in the world.

4 *Aiolopus markensis* Yin, 1984

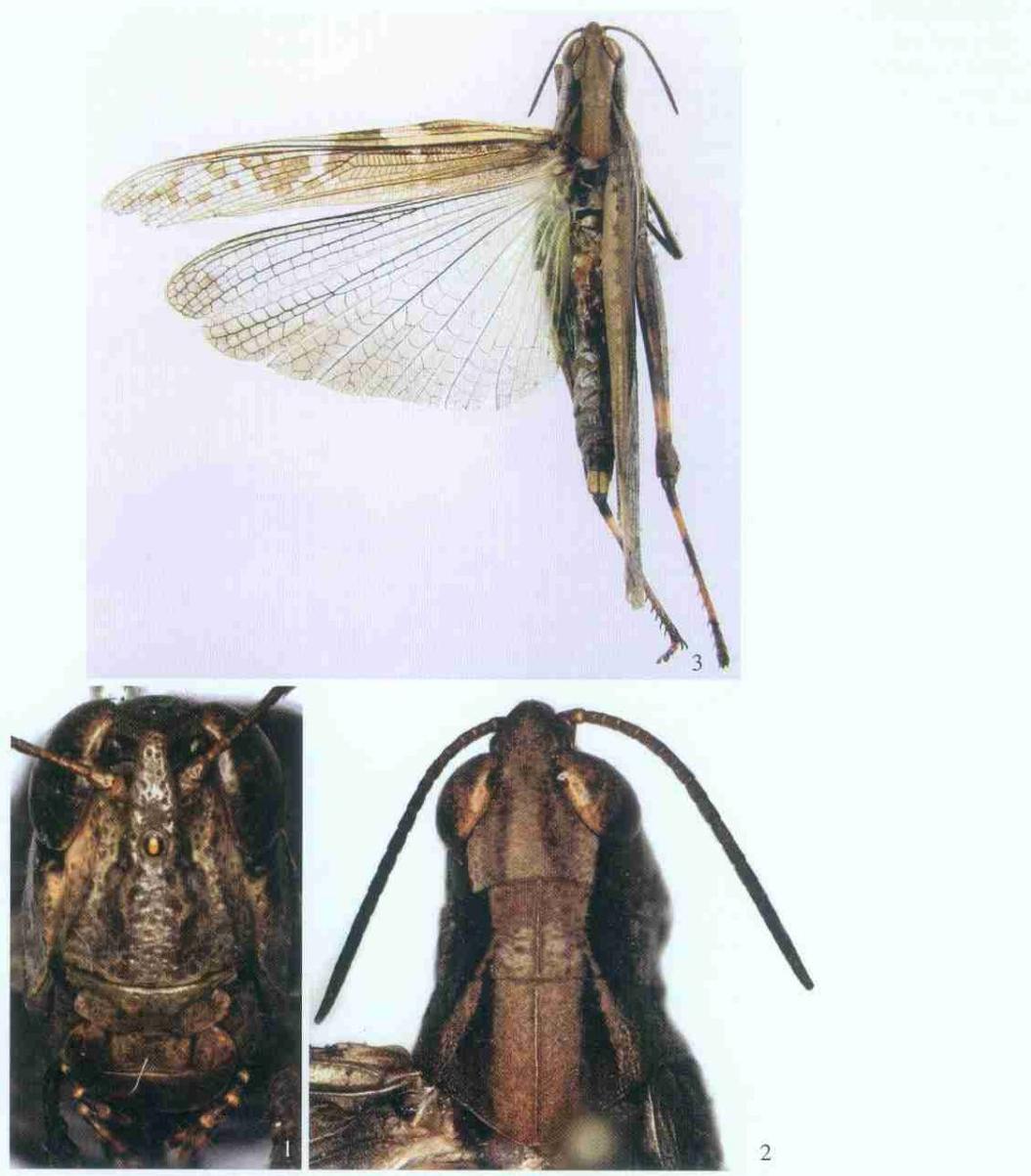
Aiolopus markensis Yin, 1984. 101-102; Zheng, 1993. 211; Zheng and Xia, 1998. 91-92.

Specimens examined. 1♂, 2♀♀, Tibet, Chayu, 4 Oct. 2007.

Distribution. Tibet, Sichuan Province.

5 *Aiolopus morulimarginis* sp. nov. (Figs. 1-3)

Female. body moderate. Vertex triangular, apex acute angular, lateral keels of vertex incurved at end, reaching anterior margin of eyes; frons oblique, frontal ridge wide and flat, concave at median ocellus, lateral margins of frontal ridge narrower upward from median ocellus; foveola trapezoidal, anterior margin narrow, and posterior margin wide, length about 2 times of width. Eyes oval, longitudinal diameter 1.5 times length of subocular furrow. Antennae filiform, not reaching posterior margin of pronotum, length of middle segment twice as long as its width. Pronotum nearly saddle, middle part a little contracting, anterior margin straight, posterior margin protrude obtusely, apical round; median keel distinct, lateral keels absent; medial carinae incised by posterior transverse sulcus with a clear cut, length of metazona 1.8 times length of prozona; Highness of pronotum lateral lobe larger than its length, anterior lower angle obtuse angle shaped, posterior lower angle right angle shaped. Prosternum flat; Width of mesosternum lobes larger than its length, interspace nearly square; Metasternum lobes divided. Tegmen and



Figs 1-3. *Aiolopus monilimarginis* sp. nov. 1. Head, front view. 2. Head and pronotum, dorsal view. 3. Elytron and wing.

wing developed, beyond apex of hind femur, tegmen narrow and long, intercalary vein of medial area thick, the end part near media; cubital area with intercalary vein also. Length of hind femur 4.3 times its width, median keel of upper side smooth, apex of lower knee lobe rounded. Hind tibia on outer side with 10 spines, and on inner side with 9-10 spines, outer apical spine absent. Aridium of tarsus only reach half of the claws. Tympanal organ developed, tympanal rounded. Epiproct long triangular, with transverse sulcus in middle, basal half with longitudinal sulcus in middle. Cercus short conical. Valvulae thick and short, apical hooklike. Length of subgenital plate larger than its width, posterior margin with angular protuberance.

Body brown. Dorsal of head with two dark longitudinal stripes, postocular band black. Antennae blackish brown. Middle of pronotum with wide yellowish

brown stripe, from the anterior transverse sulcus to the backward two sides with a yellowish brown stripe each. Lateral of pronotum with wide back longitudinal stripe. Basal half of tegmen brown, apex half tinge, with some small broken brown spots, subcostal area with white longitudinal stripes in basal half. Hind wing transparent, outer margin dark brown. Outer side of hind femur brown, knees black, near the knee with tinge preknee ring, inner side with two big spots and tinge preknee ring, lower side yellowish brown. Hind tibia black, middle part with two wide yellowish brown rings.

Male. Unknown.

♀. Length of body 22.0-22.5 mm; length of elytra 23-24 mm; length of hind femur 11-12 mm.

Holotype ♀, Shaanxi, Xi'an ($34^{\circ}1'N$, $108^{\circ}9'E$), 30 Aug. 2007, collected by SUN Hui Min. Paratype 1 ♀, same data as holotype.

This new species is allied to *Aiolopus markamensis* Yin, 1984. It differs from the latter in Table 1.

Table 1. Difference between *Aiolopus morulimarginis* sp. nov. and *Aiolopus markamensis*.

	<i>Aiolopus markamensis</i>	<i>Aiolopus morulimarginis</i> sp. nov.
Lateral keels of vertex	Straight, not incurved, reaching anterior margin of eyes	Incurved at end, reaching anterior margin of eyes
Longitudinal diameter of eyes larger than length of subocular furrow	2 times	1.5 times
Apex of female ovipositor valves	Straight, sharp slightly	Hooklike
Subcostal area of tegmen	With white spot near basal 1/3	With white longitudinal stripe at basal half
Wing	Basal part yellowish green, others dark brown	Transparent, outer margin dark brown
Hind tibia	Apical 1/3 red, basal 2/3 yellowish white, with a dark spot in the middle	Black, with two wide yellowish brown rings in the middle

Etymology. The specific name is derived from the Latin “*morul*” and “*marg*”.

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中国绿纹蝗属分类研究及一新种记述(直翅目, 斑翅蝗科)

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摘要 记述了我国绿纹蝗属5种,其中有1新种,即暗边绿纹蝗 *Aiolopus morulimarginis* sp. nov.,附有检索表和种类分布情况,模式标本保存于陕西师范大学动物研究所昆虫标本室。

暗边绿纹蝗, 新种 *Aiolopus morulimarginis* sp. nov. (图1~3)

新种近似于芒康绿纹蝗 *Aiolopus markamensis* Yin, 1984, 主要区别为: 1) 头顶侧缘隆线在端部弯曲, 到达复眼前缘; 2)

关键词 直翅目, 斑翅蝗科, 新种, 中国.

中图分类号 Q969. 26

复眼纵径为眼下沟长的1.5倍; 3) 雌性产卵瓣端部钩状; 4) 前翅亚前缘脉域基半具白色纵纹; 5) 后翅透明, 沿外缘具烟色边; 6) 后足胫节黑色, 中部具二宽黄色环。

正模♀, 陕西西安(陕西师范大学长安校区), 2007-08-30, 孙慧敏; 副模1♀, 同正模。

词源: 种名以拉丁字“*morul*”及“*marg*”为名。